

TITLE: BIKE HANDLE TIGHTENING DEVICE
AFTER SEPARATED FROM A BIKE FRAME

BACKGROUND OF THE INVENTIION

5 This invention relates to a bike handle tightening device after separated from a bike frame, particularly to one tightening the separated handle to the bike frame to reduce packaging material for storing and transporting, and in addition to help position a bike stably after
10 collapsed.

 Bike makers generally try to reduce transporting cost to increase the number of bikes to be transported in a container by means of packaging the bike frames not assembled with handles combined with brake lines and
15 speed changing lines so as to lessen the size of package boxes. Then consumers assemble the handle with the brake lines and the speed changing lines with the bike frame. This kind of packaging bikes is more popular for collapsible bikes, which are collapsed by bending a front
20 frame on a rear frame or vice versa to reduce the size of bikes to be packaged for transporting so that makers may lessen the cost for package material and consumers may easily carry or store a bike. However, a handle is hardly separated from a bike frame once it is combined with the
25 frame, so there arises a problem that the handle with the vertical tube of a front fork tube may take not a small space. Then the handle is designed to be bendable to

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solve this problem. But this structure has been found to have the following disadvantages

1. As for transporting, although the handle may be positioned flat on one side of the bike frame, the handle may collide with the frame to result in dropping of paints or disfiguring to cause a disqualified bike.

2. As for assembling, the frame and the handle are separated from each other, but are connected with some brake lines and speed changing lines, so consumers may forget to take out the frame together with the handle, and the handle may be fall down on the ground or pull along the lines to become loose or disfigured.

3. As for collapsible bikes, the handle needs to add a bendable joint or a component for positioning in order to make the handle bendable to reduce the package size,

4. As for the collapsed condition, there is no stabilizing means for the collapsed front frame and the collapsed rear frame in a package box, so the front frame and the rear frame may expand easily with the pivot joint as a fulcrum, especially in case of a user carrying them to a great embarrassment to the user.

SUMMARY OF THE INVENTION

This invention is to offer a bike handle tightening device after separated from a bike frame, in order to

reduce its size for package, transporting and storing and to help stabilizing a bike after collapsed.

The feature of the invention is the bike handle tightening device having a sidewise hollow fix tube, a vertical rod of a handle being hollow and sloped in its bottom end, a threaded rod inserting in the vertical rod from its top with its bottom exposing out of the vertical rod, and a tightening member having a sloped upper surface to contact a sloped bottom end surface of the vertical rod and screwed with the threaded rod. Then the vertical rod and the tightening member are inserted in the fix tube, and the threaded rod is rotated to move the tightening member and the vertical rod, forcing the axis of the tightening member and that of the vertical rod become not aligned to let the outer surfaces of the tightening member and the vertical rod tightly push the inner wall of the fix tube so as to let the handle tightened on the bike frame.

BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of a handle separated from a bike frame in the present invention:

Figure 2 is a partial magnified view of Fig. 1:

Figure 3 is a cross-sectional view of operating a handle tightening device in the present invention:

Figure 4 is a cross-sectional view of operating a handle tightening device in the present invention, showing different degree of tightening the handle:

Figure 5 is a perspective view of the handle tightening device tightening the handle on the bike frame in the present invention:

Figure 6 is a side view of the handle tightened with the front fork of the bike frame in the present invention: and,

Figure 7 is a partial magnified cross-sectional view of Fig. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A bike handle tightening device after separated from a bike frame in the present invention, as shown in Fig. 1, includes a vertical rod 41 of a handle 4 combined with a front fork tube of a front frame 1 of a bike, and a fix tube 21 fixed at a proper position of a rear frame 2 of a bike as main components combined together.

The vertical rod 41 of the handle 4 is hollow, having a sloped bottom end surface, and a threaded rod 42 inserted in the vertical rod from top, as shown in Fig. 2. The threaded rod 42 has an upper end pivotally connected to a L-shaped operating rod 421, and a bottom end protruding out of the bottom of the vertical rod 41, and a column-shaped tightening member 43 has an upper sloped surface to contact the sloped bottom end surface

of the vertical rod 41, a center threaded hole to screw with the threaded rod 42, and plural lengthwise straight ribs 431 formed on a longer side wall for increasing friction, as shown in Fig. 3.

5 The fix tube 21 is fixed on a proper position of a rear frame of a bike, having an inner diameter a bit larger than the diameter of the vertical rod 41, and a protective cover 211 inserted to close the outer end of the fix tube 21, as shown in Fig. 4, but not absolutely
10 necessary.

 In assembling, the bike handle tightening device may have two kinds of assembled conditions, one for collapsing and the other for riding. First, if it is assembled for collapsing, referring to Figs. 3, 4 and 5,
15 loosen a collapsing joint 3 connecting the front frame 1 and the rear frame 2 to pivotally bend the front frame 1 and the rear frame 2 to each other, and then the vertical rod 41 together with the tightening member 43 is inserted in the fix tube 21 of the rear frame 2, as shown
20 in Fig. 3. Then rotate the operating rod 421 and subsequently the threaded rod 42 together, forcing the tightening member 43 move along the threaded rod 42 straightly to the vertical rod 41, with the upper surface of the tightening member 43 rotating along the bottom
25 end surface of the vertical rod 41 so that the tightening member may bias out of the same axis as that of the vertical rod 41, with the lengthwise straight ribs 431 of

the tightening member 43 tightly pushing the inner wall of the fix tube 21 while the outer wall of the vertical rod 41 contrary to the straight ribs 431 pushes against the inner wall of the fix tube 21 to stabilize the handle 4 in the fix tube 21. Then the protective cover 211 closes the outer side of the fix tube 21, preventing dirt and miscellaneous things from entering the fix tube 21. Thus the handle 4 is tightened with the collapsed bike frame as shown in Fig. 5. In addition, the upper end of the front fork tube 11 is open in case of the handle 4 is tightened in the fix tube 21, so an upper cap 111 may be provided to close up the upper end of the front fork 11, as shown in Figs. 2 and 5.

As can be seen from Fig. 5, the vertical rod 41 is stabilized with the rear frame 2 in case of the handle 4 tightened in the fix tube 21, and the vertical rod 41 also pushes against the front frame 1, keeping the front frame 1 and the rear frame 2 in a stable position and preventing them from expanding, convenient to carry, making up another kind of function for a collapsible bike.

Next, as shown in Figs. 6 and 7, if a user wants to ride the bike collapsed, first separate the handle 4 from the fix tube 21, evolve the front frame 1 and the rear frame 2 with the collapsing joint 3 as a fulcrum and stabilize the joint 3, insert the vertical rod 41 of the handle 4 in the front fork tube 11, with the upper cap 111 removed. Then rotate the operating rod 421 together with

the threaded rod 42, forcing the vertical rod 41 and the
tightening member 43 push against the inner wall of the
front fork tube 11 tightly, as shown in Fig. 7. Lastly the
operating rod 421 is pressed down to contact the front
5 fork tube 11, as shown in Fig. 6, forming the bike in a
position to ride. Provided the bike is wanted to be
collapsed after riding, fold the front frame 1 and the
rear frame 2 to each other according to the process
described above, and separate the handle 4 from the
10 front fork tube 11 and rotate and insert the handle 4 in
the fix tube 21 in the collapsed position shown in Figs. 4
and 5.

The bike handle tightening device has several
advantages, as understood from the aforesaid
15 description.

1. In packaging and transporting, the handle 4
is tightened on the rear frame, not assembled with the
front fork tube 11, effectively reducing the size of the
package box, and no possibility of the paint of the
20 bike frame falling off caused by colliding with the
handle in transporting.

2. When a consumer buys a bike packaged and
opens the package box to take out the bike, there is no
fear of the handle 4 and the brake lines or the speed
25 changing lines falling off on the ground in taking out
the bike frame.

3. The handle is directly taken off to reduce

the size of the package, getting rid of a joint added for bending the handle in a conventional collapsible bike, lessening the cost for package and transporting and simplifying the whole structure.

5 4. The handle 4 also stabilizes stable the front frame 1 when the handle 4 is tightened on the rear frame 2, as shown in Fig. 5, so the front frame 1 and the rear frame 2 cannot extend with the collapsing joint 3 in transporting or carrying,

10 5. The lengthwise straight ribs 431 on the outer wall of the longer side of the tightening member 43 can largely heighten the friction between the front fork tube 11 and the fix tube 21, ensuring tightening function of the handle 4, which is then impossible to
15 fall off during transporting.